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EXAMINER

VERBITSKY, GAIL KAPLAN

ART UNIT

PAPER NUMBER

2859

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/176,580

Applicant(s)
Sundaram et al.

Examiner
Gail Verbitsky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on Jan 29, 2002

2a) ☐ This action is FINAL.

2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 2, 4-7, 9-16, 18, 20, 21, and 23-27 is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 2, 4-7, 9-16, 18, 20, 21, and 23-27 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on Jan. 29, 2002 is/are a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

4) ☐ Interview Summary (PTO-413) Paper No(s). _____

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

5) ☐ Notice of Informal Patent Application (PTO-152)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 25

6) ☐ Other:

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DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “surface portion” and “thickness portion intersecting the surface portion”, “raised bearing surface” must be shown or the feature(s) canceled from the claim(s) 2. No new matter should be entered.

Specification

2. The disclosure is objected to because of the following informalities: “the thickness portion intersecting the surface portion...”, “raised bearing” portion/ surface, as stated in claim 2. Also, perhaps applicant should add --glide bodies after “sliders” in page 14, line 3 in order to maintain consistency through the claims and specification. Is this a proper interpretation of the invention? Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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4. Claims 2, 4-7, 9-15, 23-24 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In this case, “a thickness portion intersecting...” is not described in the specification.

Claims 4-7, 9-15, 23-24 are rejected by virtue of their dependency on claim 2.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 2, 4-6, 9-15, 23-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In this case,

Claim 2: “a thickness portion intersecting...” makes the claim language is confusing because it is not clear what particular portion applicant means, how “a thickness portion” intersects the extending surface portion and thus, how a glide interface (what surfaces) is being formed.

Claims 4-6, 9-15, 23-24 are rejected by virtue of their dependency on claim 2.

6. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a

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gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: It is not clear how “a raised bearing surface” and “a recessed surface” are structurally related.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2, 4-6, 9-11, 14-16, 23, 25, 27 (as best understood by the Examiner) are rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou et al. '184 [hereinafter Boutaghou].

Boutaghou discloses in Figs. 1-4 and 13 a thermal asperity sensor comprising a slider body 12 having a leading edge A, transducers (magnetoresistive sensors/ MR) 18 spaced apart along the length of rails (elevated/ raised bearing surface) 26 of an air bearing surface 14 ABS (col. 6, lines 6-7 and Fig. 1), a control circuitry (glide test system) for moving a head and lifting it above a disc/ surface of interest (col. 1, lines 27-30). The leading edge is generally transverse (in this case perpendicular) to the ABS. The ABS also has a recessed surface B (Fig. 13). The transducers 18 are coupled to a peak circuitry 25 detecting a voltage spike indicative of a “thermal asperity” on the disc through bond pads (physical contact) or terminals (conductive

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strips) on a surface of the slider body 12 (col. 3, lines 36-38 and 56-58) and being capable to detect PZT excitation or other signals (col. 3, lines 43-45). The MR are fabricated by a known technique from NiFe (col. 3, line 23) by deposition of very thin, as known in the art (col. 4, lines 8-9), layers, thus, constituting a thin (having thickness) flat (col. 7, line 20) asperity contacting surface oriented along the ABS. Boutaghou also states that, during the fabrication process, portions of rails act as substrates 28 upon which sensor layers 18 are deposited (col. 3, lines 56-58). Since the rails are formed on the ABS (Fig. 2), inherently, it is expected that the ABS be configured prior to the deposition process. As shown in Fig. 1, the transducers are oriented along (portion extending) the ABS. Inherently, the thickness of the transducer is intersecting with its portion extending along the ABS. (The numerals A- B have been added by the Examiner, see attachment to the Office Action). In a broad sense, Boutaghou discloses that the pads are proximate to the trailing edge because as shown in the drawings, the transducers are close to the trailing edge.

Boutaghou does not explicitly disclose the particular size of the transducers and other limitations of claims 2, 4-6, 9-11, 14-16, 23-25, 27.

With respect to the particular size of the transducers (how far it extends on the slider) as stated in claims 9 and 10: the particular size of the transducers, absent any criticality, is only considered to be the “optimum” size of the transducers in the device disclosed by Boutaghou that a person having ordinary skill in the art would have been able to determine using routine experimentation based, among other things, on the size of the device, etc. In re Boesch, 205

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USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device disclosed by Boutaghou so as to extend the thermal transducers to possibly occupy the surface between the trailing and the leading edges in order to allow better contact with the surface of interest in order to achieve more accurate results.

With respect to claim 16: the method steps will be met during the normal manufacturing of the device stated above.

10. Claims 18, 21 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou in view of Yura et al. (U.S. 5177860) [hereinafter Yura].

Boutaghou discloses a device and method as stated above in paragraph 9.

Boutaghou does not explicitly teaches to slice a plurality of glide bodies from a wafer.

Yura discloses a device in the field of applicant's endeavor and a method of manufacturing glide heads comprising cutting the slider wafer 1 into individual head sliders/ glide bodies (abstract and Fig. 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed by Boutaghou so as to slice a plurality of glide heads from a wafer simultaneously, as taught by Yura, in order to reduce manufacturing costs.

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11. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou as applied to claim 2, 4-6, 9-11, 14-16, 23, 25, 27 above, and further in view of Yura.

Boutaghou discloses a device as stated above in paragraph 9.

Boutaghou does not explicitly disclose depositing thermal transducers prior to slicing a wafer.

Yura teaches in Fig. 5 to attach structures (head elements 2) to raised bearing surfaces of a slider wafer before slicing the wafer onto glide bodies. Yura also shows fabricating a raised bearing surface and a recessed surface on each glide body of the plurality of glide bodies.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device disclosed by Boutaghou so as to deposit transducers (structures) onto the bearing surface before slicing individual glide bodies, as taught by Yura, so as to reduce the manufacturing costs.

12. Claim 7 (as best understood by the Examiner) is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou as applied to claims 2, 4-6, 9-11, 14-16, 23, 25, 27 above, and further in view of Padovani et al. (U.S. 5372427) [hereinafter Padovani].

Boutaghou discloses the device as stated above in paragraph 9.

Boutaghou does not disclose the limitations of claim 7.

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Padovani discloses in Fig. 1 a device comprises a thermally sensitive element (thermal transducer) 14 having conductive strips 20.4 attached to terminals (conductive pads) 20.3 to provide an electrical contact between the transducer and the pads.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add conductive strips, as taught by Padovani, to the device disclosed by Boutaghou, so as to provide an electrical contact, as already suggested by Padovani, between the transducer(s) and pads in order to convey an electrical signal further to a processing circuit, as already suggested by Padovani.

14. Claim 12 (as best understood by the Examiner) is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou as applied to claims 2, 4-6, 9-11, 14-16, 23, 25, 27 above, and further in view of Flechsig et al. [hereinafter Flechsig].

Boutaghou discloses a device as stated above in paragraphs 9.

Boutaghou does not explicitly disclose grounding of the thermal transducers as stated in claim 12.

Flechsig discloses in Fig. 9 a port 120 to which a sensor 91 is grounded.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to electrically ground transducers disclosed by Boutaghou to a ground port, as taught by Flechsig, in order to stabilize or limit the voltage to ground.

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Official Notice is taken with respect to having a common electrical ground as stated in claim 12 since it is very well known in the art to electrically ground transducers in the same circuitry or device to the same (common) electrical ground conductor in order to minimize the number of lines having "0" potential in the same circuitry and, thus, to minimize noise-to-signal ratio.

15. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou '184 as applied to claims 2, 4-6, 9-11, 14-16, 23, 25, 27 in view of Nguyen et al. [hereinafter Nguyen].

Boutaghou discloses the device as stated above in paragraphs 9.

Boutaghou does not explicitly disclose the limitations of claim 20.

Nguyen discloses a device comprising a thin film transducer 28 mounted on a rail 24 mounted on an ABS 23 or 24 (col. 2, lines 36-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the MR sensors in the device disclosed by Boutaghou of a thin film, as taught by Nguyen, so as to decrease weight of the transducers, and thus, to improve an accuracy of asperity detection.

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16. Claim 24 (as best understood by the Examiner) is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou as applied to claims 2, 4-6, 9-11, 14-16, 23, 25, 27 above in view of Ishimaga et al. 6234599 [hereinafter Ishimaga].

Boutaghou discloses the device as stated above in paragraph 9.

Boutaghou does not disclose the limitations of claim 24.

Ishimaga teaches (col. 30, line 52) a temperature sensor (transducer) covered with a protective layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a protective layer to the transducers disclosed by Boutaghou, as taught by Ishimaga, so as to protect the transducers from undesirable contacts in order to improve an accuracy of the detection.

17. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

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Response to Arguments

18. Applicant's arguments with respect to claims 2, 4-7, 9-16, 18, 20-21, 23-27 have been considered but are moot in view of the new ground(s) of rejection.

Applicant states that in Boutaghou, the transducers are not formed on the raised surface. However, as shown in Fig. 2, the raised surface of the ABS is a rail and the transducers are formed on the rail (raised surface).

With respect to claims 9-10: Applicant states that the particular size/ number of the transducers is critical in order to occupy the length from the trailing edge to the leading edge on the ABS. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device disclosed by Boutaghou so as have a plurality of transducers in order to occupy more space on the surface of ABS in order to contact a greater area on the surface of interest, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. See *In re St. Regis Paper Co. V. Bemis Co., Inc.*, 193 USPQ 8, 11 (7th Cir. 1977).

With respect to claim 16: applicant argues that the steps claimed in claim 16 will not be met during "the normal manufacturing process" as stated by examiner. Applicant argues that "normal" steps known in the prior art are different. However, Examiner refers to "the normal manufacturing process" of the device disclosed by Boutaghou. Boutaghou states that during the fabricating process, portions of (raised surface) rails 26 act like substrates upon which

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transducers are deposited (col. 3, lines 56-58). Therefore, the transducers are deposited onto the rails (thus, after the rails have been formed). When the rails (raised bearing surface) are formed, the surface between them inherently becomes a recessed surface. Since the rails are part of the ABS, thus, the ABS is fabricated before the transducers are deposited.

With respect to claims 7, 18, 21 and 26: the arguments are moot in the view of the new grounds of rejection.

With respect to claim 20: Applicant states that Nguen does not teach thin film head formed on a raised surface. However, the combination of Boutaghou and Nguen does.

Allowable Subject Matter

19. Claim 13 (as best understood by the Examiner) would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 disclose related devices.

21. Any inquiry concerning this communication should be directed to the examiner Verbitsky whose telephone number is (703) 306-5473.

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Any inquiry related to the status of this application should be directed to the Group
Receptionist whose telephone number is (703) 308-0956.

GKV



May 29, 2002

Diego Gutierrez

Supervisory Patent Examiner

TC 2800